DNM 750 Ⅱ series

High Productivity Vertical Machining Center

Doosan Machine Tools

Optimal Solutions for the Future

High Productivity Vertical Machining Center

The DNM 750 includes a spindle head cooling system which minimises thermal effects on the spindle. This enables a variety of medium to large parts to be machined to a high level of accuracy even at high speed.
In addition, the roller guideways and high strength arch structure of the column provide a highly rigid frame for stable machining conditions.

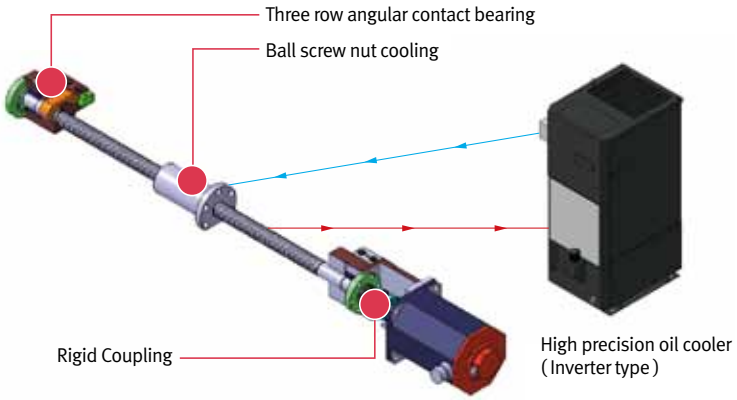
DNM 750 Ⅱ series

Features

1 X-axis travel and spindle torque available for various applications

DNM 750 [L] II & DNM 750 [L] / 50 II

		ISO #40	ISO #50
X-axis travel		1630 [2160] mm (64.2 [85] inch)	
Spindle speed	std.	8000 r/min (belt)	
	opt.	12000 r/min (direct)	10000 r/min (belt)
Spindle torque		117.1 N·m (86.4 ft-lb)	286.4 N·m (141.1 ft-lb)
Max. tool weight		1500 [1800] kg (3306.9 [3968.3] lb)	



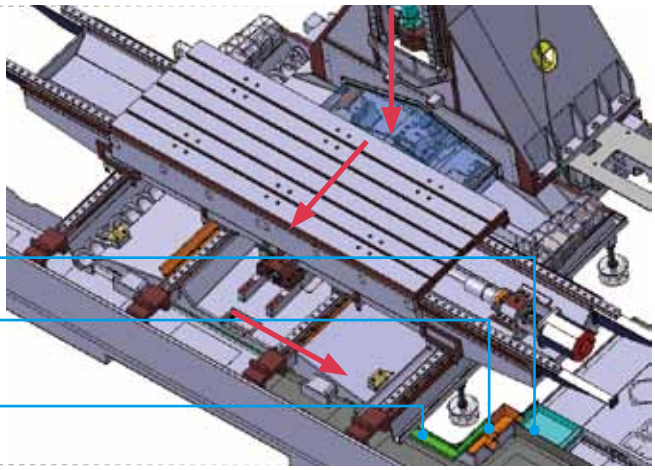
2 Cooling system to minimize thermal displacement

Thermal displacement of the spindle and axes is achieved by circulating cooling oil via an oil cooler to the spindle head and ball screw nuts.

- Spindle head cooling system std.
- Ball screw nut cooling system std.

3 Eco-friendly waste oil separation system

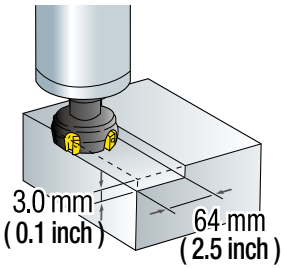
- Improved customer environment by separating waste lubricant and coolant.
- Reduced maintenance cost by extending the life of coolant by 80%



High Productivity

Machining capacity (ISO #40)

Face mill_Carbon steel (SM45C) ø80mm Face mill (6Z)

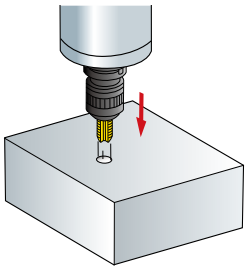


Machining rate
570 cm³/min

Spindle speed
1500 r/min

Feedrate
2970 mm/min (116.9 ipm)

Tap_Carbon steel (SM45C)



Machining rate
M30 x P3.5

Spindle speed
200 r/min

Feedrate
700 mm/min (27.6 ipm)

※ The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Rapid traverse

The linear motion guide ways and the high-speed servo motors enable fast axis movements, which reduce machining time and non-cutting time, resulting in enhanced productivity.

	DNM 750 II [DNM 750 / 50 II]	DNM 750L II [DNM 750L / 50 II]
X-axis	30 m/min	24 m/min
Y-axis	30 m/min	24 m/min
Z-axis	24 m/min	24 m/min

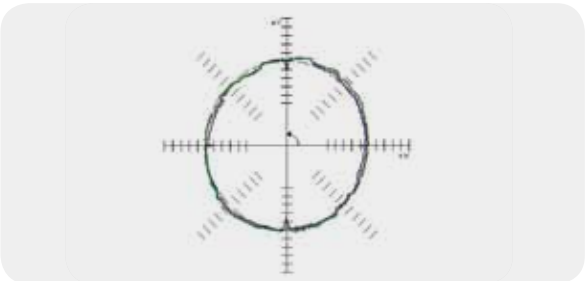
Auto tool change

Fast tool change time using a cam-type tool changer helps improve productivity.

	DNM 750 [L] II	DNM 750 [L] / 50 II
Tool change time (T-T-T)	1.3	2.5
Tool change time (C-T-C)	3.7	5.5
Tool storage capacity	30 { 40 / 60 opt. }	24 { 30 opt. }

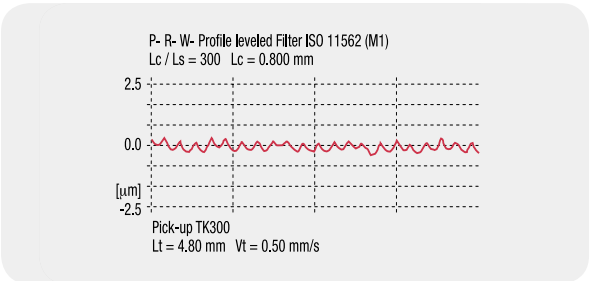
Machining Accuracy

Ball bar test 4.7 µm



Roughness Ra 0.18 µm

- Spindle speed : 8000 r/min
- Feedrate : 1200 mm/min (47.2 ipm)

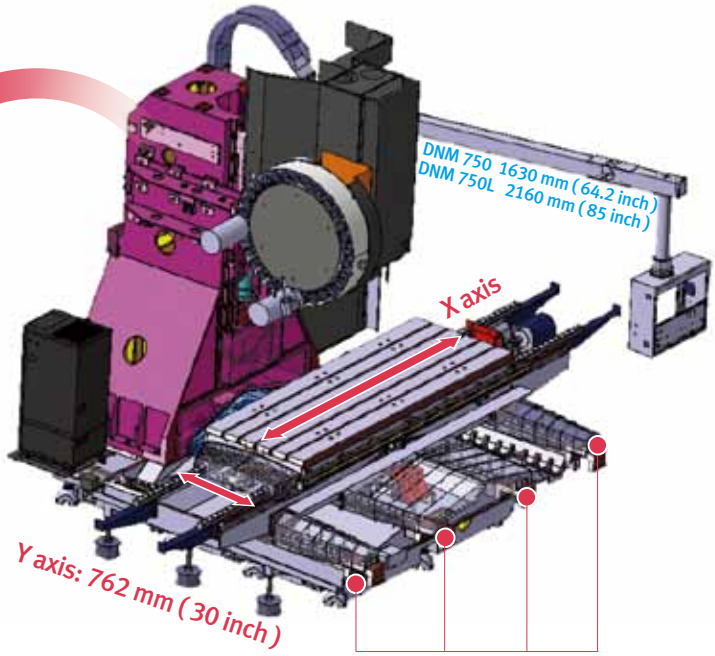


High Rigidity Body

Key machine elements such as bed and column are made of Meehanite castings which have excellent vibration absorption characteristics and are designed to minimise deformation caused by heavy duty cutting.
Roller type linear guideways are used to provide a combination of rigidity for heavy duty cutting and also high speed / high precision movement of each axis for high speed machining.

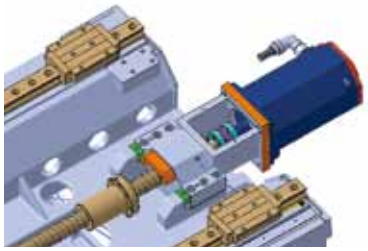
Arch-shaped structure

Key machine elements such as bed and column are designed to provide optimum rigidity for high speed / heavy duty machining.



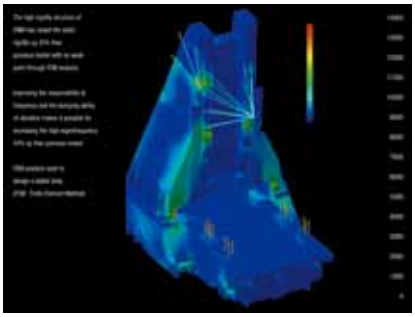
- The DNM 750L uses four roller guideways in the Y axis to eliminate overhang and provide optimum stability (DNM 750 has two roller guideways).

High-strength roller type linear motion guide way



- High-stiffness Ball Screw & Coupling

- Strong 45 size roller type linear guide way



Static rigidity

The high-rigid structure of DNM 750 series had raised the static rigidity up more than previous models through FEM analysis.

Dynamic stiffness

Dynamic analysis was used in simulations of actual cutting to improve dynamic stiffness and dampen vibration during design stage.

- FEM analysis used to design a stable body. (FEM : Finite Element Method)

High Speed Spindle

Spindle

ISO #40

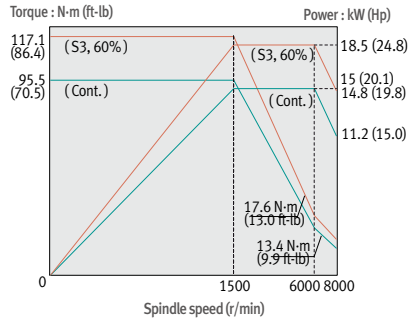
ISO #50

		ISO #40	ISO #50
std.	Spindle speed	8000 r/min (belt)	8000 r/min (belt)
	Spindle torque	117.1 N·m (86.4 ft-lb)	286.4 N·m (211.4 ft-lb)
	Spindle motor power (30min / Cont.)	18.5 / 15 kW (24.8 / 20.1 Hp)	15 / 11 kW (20.1 / 14.8 Hp)
opt.	Spindle speed	12000 r/min (direct)	10000 r/min (belt)
	Spindle torque	95.5 N·m (70.5 ft-lb)	165.7 N·m (122.3 ft-lb)
	Spindle motor power (30min / Cont.)	15 / 11(15.6 / 15.6) kW (20.1 / 14.8 (20.9 / 20.9) Hp)	26 / 22 kW (34.9 / 29.5 Hp)

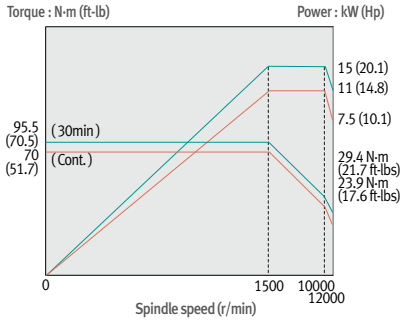
Spindle power-torque diagram

ISO #40

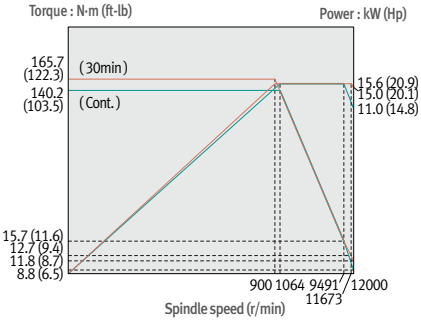
- Max. spindle speed : 8000 r/min
- Spindle motor power : 18.5 / 15 kW (24.8 / 20.1 Hp)



- Max. spindle speed : 12000 r/min
- Spindle motor power : 15 / 11 kW (20.1 / 14.8 Hp)

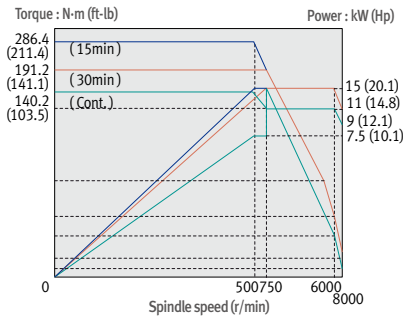


- Max. spindle speed : 12000 r/min
- Spindle motor power : 15.6 / 15.6 kW (20.9 / 20.9 Hp)

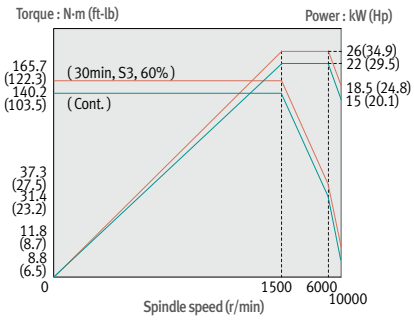


ISO #50

- Max. spindle speed : 8000 r/min
- Spindle motor power : 15 / 11 kW (20.1 / 14.8 Hp)



- Max. spindle speed : 10000 r/min
- Spindle motor power : 26 / 22 kW (34.9 / 29.5 Hp)



Operators Panel

User-friendly control panel

The control panel has been consolidated into a operator-friendly and convenient layout

PCMCIA card

The PCMCIA card is used for downloading programmes and uses a convenient slot in the CNC control panel.

Portable MPG

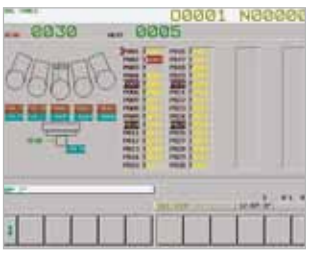
Application suitable for CNC machines by providing home mode, stop adjustment and Interruption signal.

USB port

A usb memory stick can be used for backup and restoring of CNC data. usb stick does not support DNC machine running.

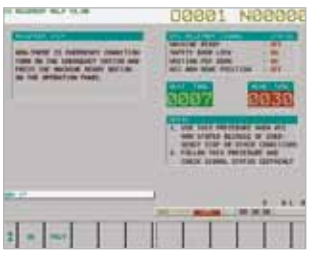
Easy Operation Package

The Doosan easy operation package has been specially customized to provide user-friendly functions and control the magazine for tools and pallets.



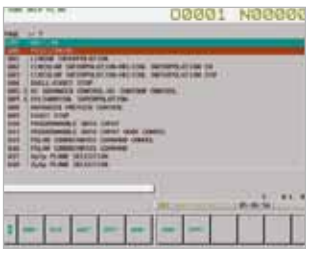
Tool table

Work-piece set up table moving



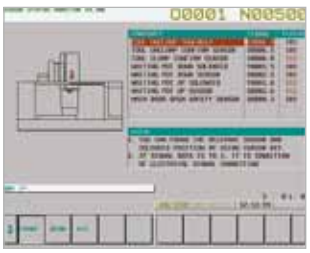
ATC recovery help

Easy parameter



G-code help

M-code help



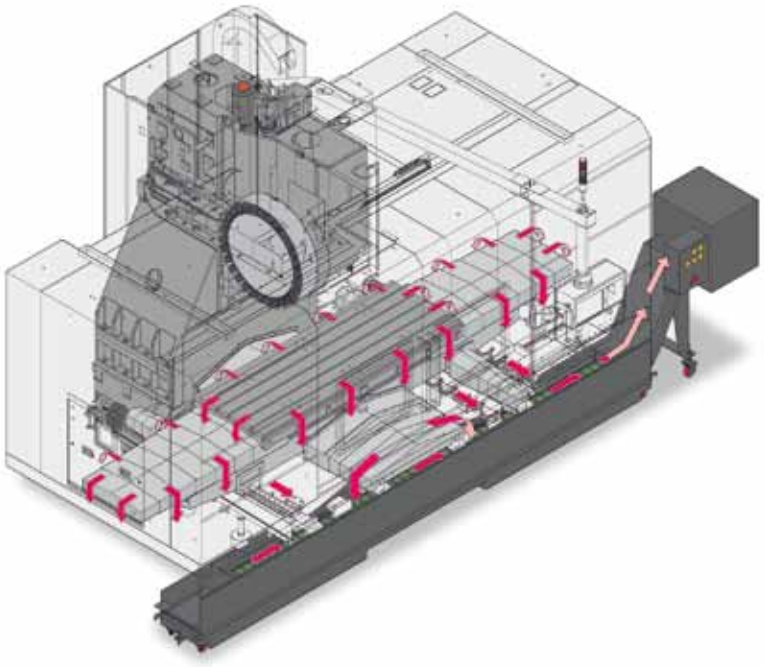
Sensor status monitor

Tool load monitor opt.

Chip Disposal

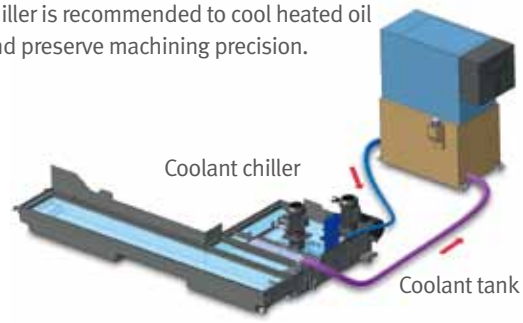
Easy chip-removal structure

Separate chip conveyor and coolant tank provide for easy cleaning and maintenance. The completely enclosed DNM 750 series guarantees to keep the chips and coolant inside of the machining area. This provides a cleaner working area for the operator.

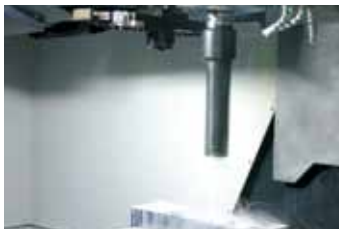


Coolant chiller opt.

The coolant chiller lowers coolant temperature, helping to cool both the workpiece and tool during the machining operation. When using insoluble coolant, a coolant chiller is recommended to cool heated oil and preserve machining precision.

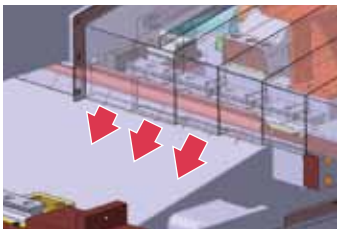


Through spindle coolant opt.



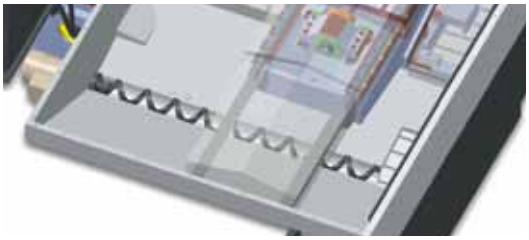
Middle pressure : 2.0 MPa (20 bar)
High pressure : 7.0 MPa (70 bar)

Side flushing



DNM 750 opt.
DNM 750L std.

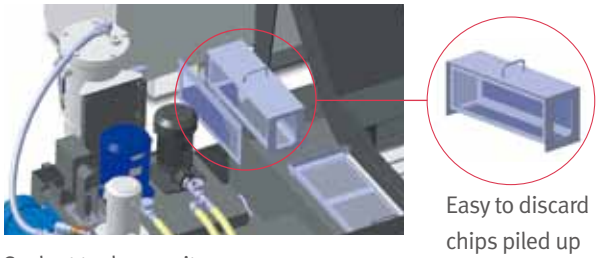
Internal screw conveyor



Chip conveyor opt.

Scraper type | Drum filter type | Hinge type

Large capacity coolant tank with chip pan and box filter

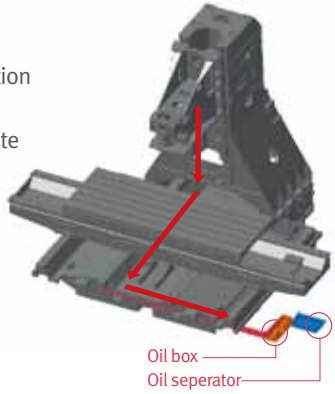


Easy to discard chips piled up

Coolant tank capacity
DNM 750 : 480L (126.8 galon)
DNM 750L : 525L (138.7 galon)

Used lubricating oil recovery system

Improved the coolant pollution environment by separating lubricating oil with a separate oil-water separation box mounted at the coolant tank to prevent lubricating and coolant from mixing.

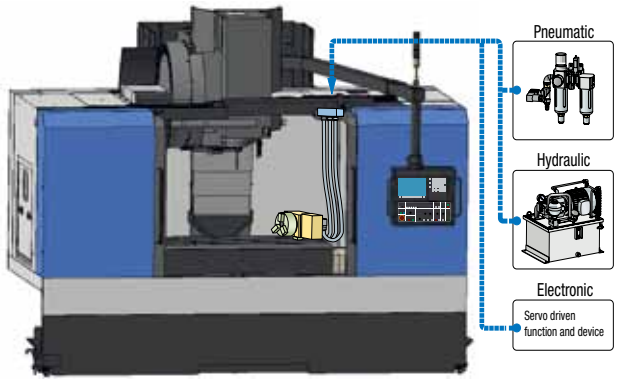


Optional Equipment

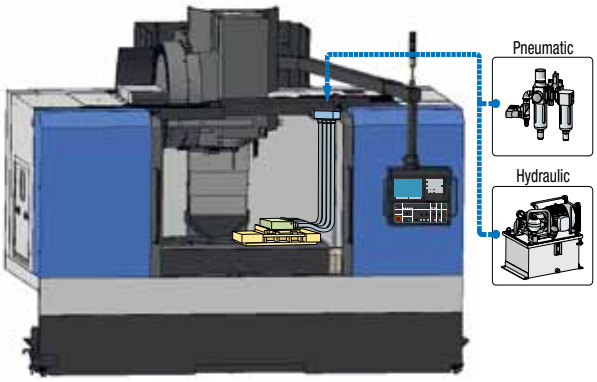
Various options available to meet customers' needs and to provide efficient work and convenience.

Interface for additional equipment

Connection example of additional 1 axis interface



Connection example of fixture interface



- Rotary table size shown in example : ø320 (DNM 750)
- Hydraulic power unit may be additionally necessary according to rotary table specifications.

Fixture check list (for hydraulic / pneumatic fixtures)

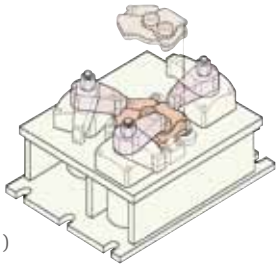
· Pressure source
- Hydraulic ☐ P/T ☐ A/B
- Pneumatic ☐ P/T ☐ A/B

· Number of ports
- ☐ 1pair (2-PT 3/8" port)
- ☐ 2pair (4-PT 3/8" port)
- ☐ 3pair (6-PT 3/8" port)

· Hydraulic power unit
- Supply scope : ☐ User ☐ Doosan
(Please check the below detail specification, if you want Doosan to supply.)

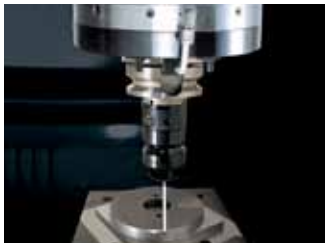
☐ Use Doosan standard unit
24 L/min (6.3 gal/min) / 4.9 MPa (711 psi)

☐ Special requirement
_____ L/min (gal/min) at _____ MPa (psi)



Automatic tool length measurement

Automatic workpiece measurement

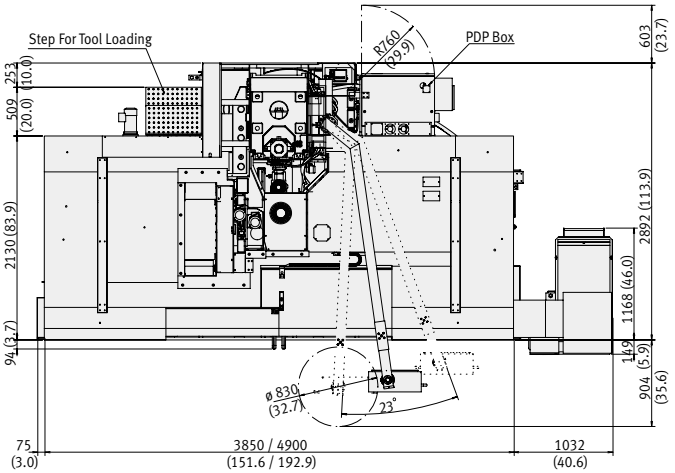


Minimum quantity lublication

Oil skimmer

External Dimensions

Top view



Side view

Unit : mm (inch)

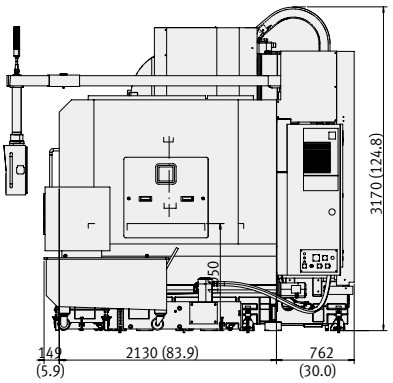
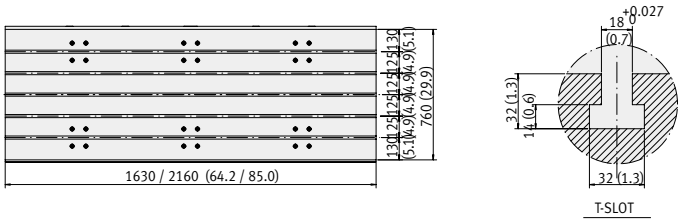


Table dimensions

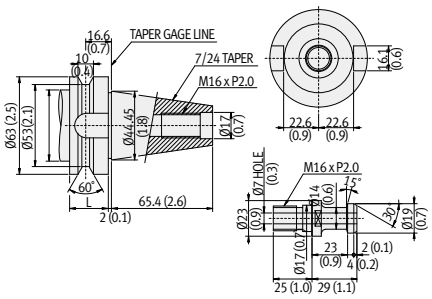


/ : DNM 750

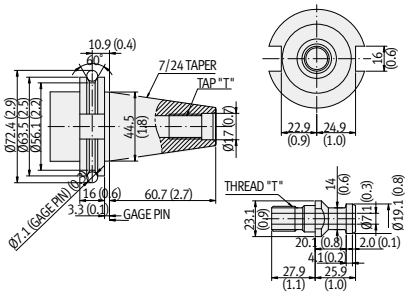
Tool shank

Unit : mm (inch)

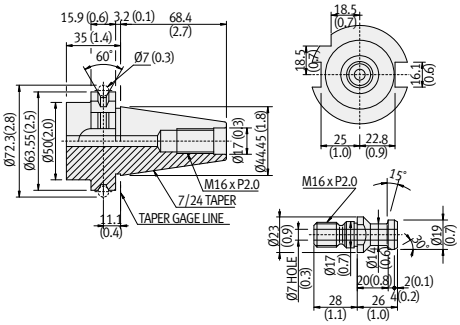
BT 40



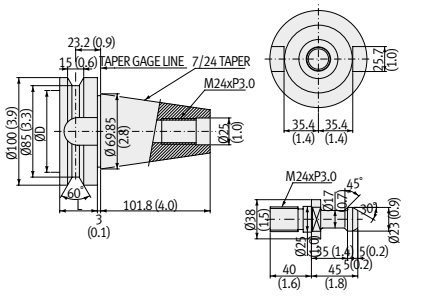
CAT 40



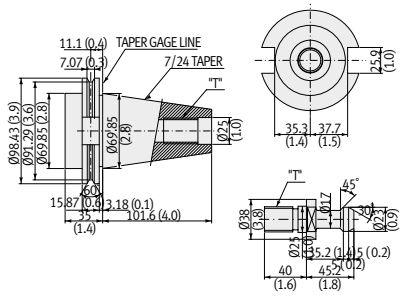
DIN 40



BT 50



CAT 50



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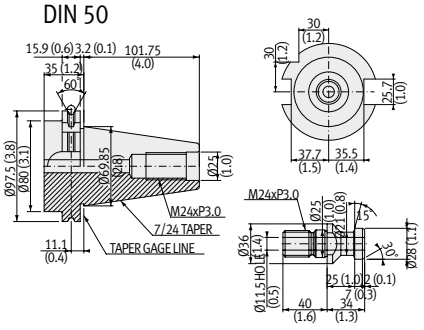


Machine Specifications

	Features	Unit	DNM 750 [L] II	DNM 750 [L] / 50 II
Travel	X-axis	mm (inch)	1630 [2160] (64.2 [85.0])	
	Y-axis	mm (inch)	762 (30.0)	
	Z-axis	mm (inch)	650 (25.6)	
Table	Distance from spindle nose to table top	mm (inch)	150 - 800 (5.9 - 31.5)	200 - 850 (7.9 - 33.5)
	Distance from spindle center to column guideway	mm (inch)	856 (33.7)	
	Table size	mm (inch)	1630 x 760 [2160 x 760] (64.2 x 29.9 [85.0 x 29.9])	
	Table loading capacity	kg (lb)	1500 [1800] (3306.9 [3968.3])	
	Table surface	-	T-SLOT	
Spindle	Max. spindle speed	r/min	8000 { 12000 }	8000 { 10000 }
	Spindle taper	-	ISO #40, 7/24 TAPER	ISO #50, 7/24 TAPER
	Max. spindle torque	N·m (ft-lb)	117.1 { 95.5 } (86.4 { 70.5 })	286.4 { 165.7 } (211.4 { 122.3 })
	Spindle motor power	kW (Hp)	18.5 / 15 { 15 / 11, 15.6 / 15.6 } (24.8 / 20.1 { 20.1 / 14.8, 20.9 / 20.9 })	15 / 11 { 26 / 22 } (20.1 / 14.8 { 34.9 / 29.5 })
Feedrate	Rapid traverse rate (X / Y / Z)	m/min (ipm)	30 / 30 / 24 [24 / 24 / 24] (1181.1 / 1181.1 /1181.1 [826.8 / 826.8 / 826.8])	
	Cutting feedrate	mm/min (ipm)	1-12000 (39.4 - 472441.0)	
ATC	Type of tool shank	-	BT / CAT / DIN 40	BT / CAT / DIN 50
	Tool storage capacity	ea	30 { 40 / 60 }	24 { 30 }
	Max. tool diameter [without adjacent tools]	mm (inch)	80 [125] (3.1 [4.9])	125 [220] (4.9 [8.7])
	Max. tool length	mm (inch)	300 (11.8)	350 (13.8)
	Max. tool weight	kg (lb)	8 (17.6)	15 (33.1)
	Method of tool selection	-	MEMORY RANDOM	
	Tool change time (tool-to-tool)	s	1.3	2.5
	Tool change time (chip-to-chip)	s	3.7	5.5
Utility	Electric power supply (Rated capacity)	kVA	40	40 { 50 }
Machine size	Machine height	mm (inch)	3170 (124.8)	
	Machine dimension (L x W)	mm (inch)	3850 [4900] x 3435 (151.6 [192.9] x 135.2)	
	Machine weight	kg (lb)	13500 [15000] (29762.0 [33068.9])	13800 [15300] (30423.3 [33730.2])
CNC	NC		FANUC, Siemens, Heidenhain	

Note : { } are optional.

Standard feature

- Assembly & operation tools
- Coolant tank & chip pan
- Door interlock
- Full enclosure splash guard
- Flood coolant system
- Installation parts
- Portable MPG
- Screw conveyor
- Signal tower (red, yellow, green)
- Spindle head cooling system
- USB port, PCMCIA
- Work light

Optional feature

- Automatic power off
- Automatic tool length measurement
- Hydraulic line for fixture
- Oil skimmer
- Pneumatic line for fixture
- Rotary table
- Test bar
- Through spindle coolant

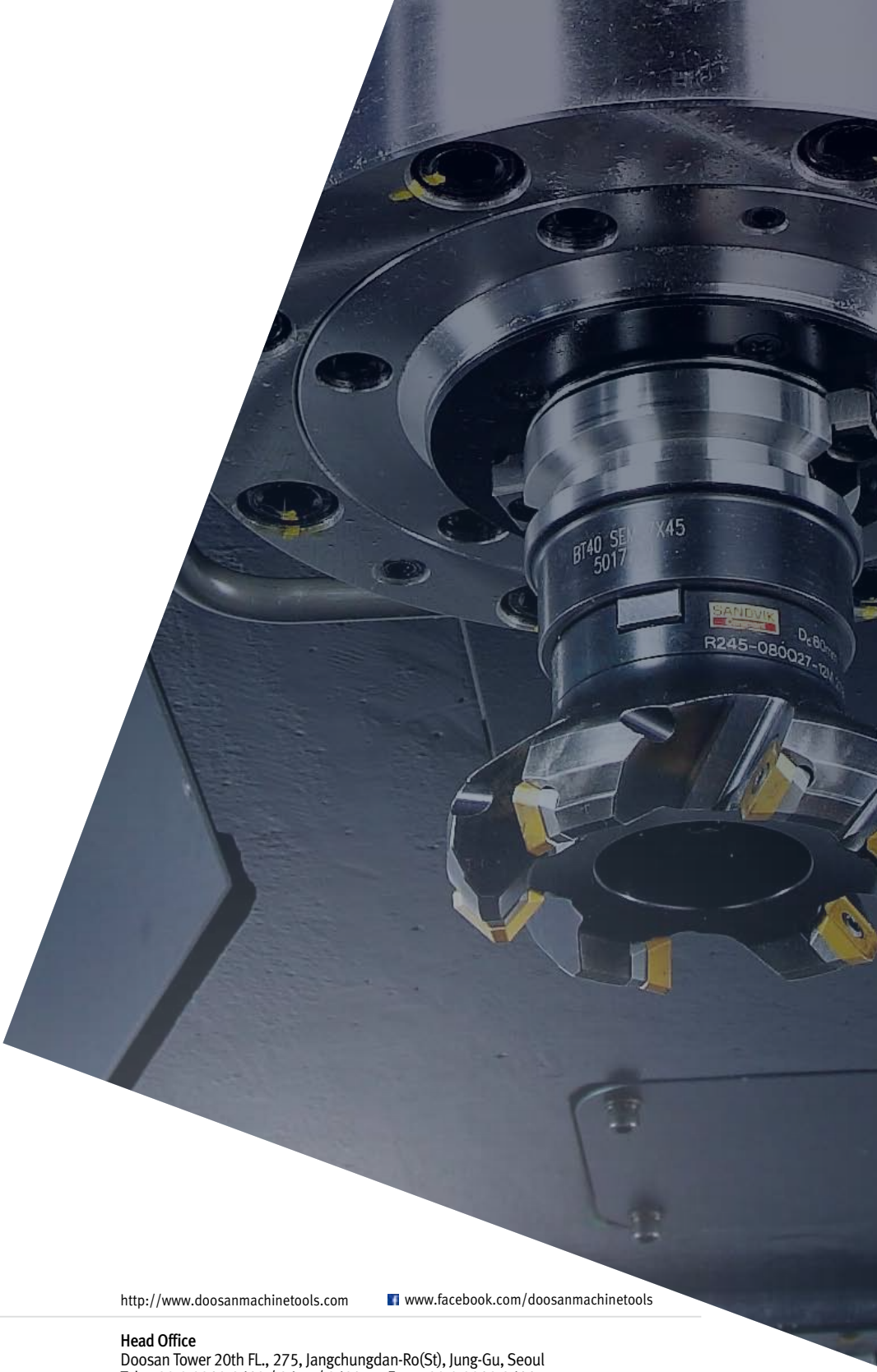
NC Unit Specifications

DOOSAN-FANUC i

Axes control	
- Controlled axes	3 (X, Y, Z)
- Simultaneously controllable axes	Positioning (G00)/Linear interpolation (G01) : 3 axes Circular interpolation (G02, G03) : 2 axes
- Backlash compensation	
- Follow up	
- Least command increment	0.001mm
- Least input increment	0.001mm
- Machine lock	all axes / Z axis
- Mirror image	Reverse axis movement (setting screen and M-function)
- Stored pitch error compensation	Pitch error offset compensation for each axis
- Stored stroke check 1	Overtraval controlled by softwar
- Absolute pulse coder	

Interpolation & Feed funtion	
- 2nd reference point return	G30
- Circular interpolation	G02, G03
- Cylindrical interpolation	G07.1
- Dwell	G04
- Exact stop check	G09, G61 (mode)
- Feed per minute	
- Feedrate override (10% increments)	0 - 200 %
- Helical interpolation	
- Jog override (10% increments)	0 - 200 %
- Linear interpolation	G01
- Manual handle feed	1 units
- Manual handle feedrate	x1, x10, x100 (per pulse)
- Override cancel	M48/M49
- Positioning	G00
- Rapid traverse override	F0 (fine feed), 25/50/100 %
- Reference point return	G27, G28, G29
- Skip function	G31

Other Features	
- Number of tool offsets	400 ea
- Tool life management	128 sets
- Tool offset memory C	Geometry / Wear and Length / Radius offset memory
- No. of Registered programs	400 ea
- Part program storage	1280 m
- Additional work coordinate system	G54.1 P1 - 48 (48 pairs)
- AICC1 : 40 block preview	
- DISPLAY unit : 10.4" Color TFT LCD	
- Embedded ethernet	



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- The specifications and information above-mentioned may be changed without prior notice.
- For more details, please contact Doosan.